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Rare Case of *Salmonella Paratyphi A* Breast Abscess in a Non-Lactating Female

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ABSTRACT
Salmonella species have been known to rarely cause breast abscess. Seeding at distant sites after bacteremia can lead to abscess formation weeks to months after initial infections, thus, posing a diagnostic challenge. *Salmonella Paratyphi A* is an extremely rare cause of breast abscess. We report a longstanding case of recurring abscess in a 33-year-old non-lactating female who developed resistance to cephalosporin over the course of therapy. She was successfully treated after intravenous Ertapenem antibiotics.

KEYWORDS: abscess; breast; *Paratyphi A;* recurring; *Salmonella*

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1. Introduction

Salmonella is a causative agent of enteric fever, gastroenteritis, and septicemia. Breast abscesses are a rare complication of Typhoid fever, with most cases reporting *Salmonella Typhi* as the causative agent [1]. *Salmonella Paratyphi A* has been only found in six published reports [2]. Clinical presentation is similar to breast abscess of other infective causes. Apart from swelling and tenderness, there may be a history of failure to respond to therapy. Such cases need thorough investigation in the interest of patient care. Delayed diagnosis usually leads to extended courses of antibiotics. We report a longstanding case of *S. Paratyphi A* breast abscess requiring repeated incision and drainage with the emergence of resistance to antimicrobials over the course of therapy.

2. Case History

A 33-year-old non-pregnant and non-lactating female presented to the surgical outpatient department in March 2018 with a history of swelling and pain in the left breast. The lesion started two weeks back with slow progressing nature. She also gave history of on-off fever (undocumented). There were no other complaints. On examination, the patient was afebrile and stable. On local examination, the left breast had a tender swelling with associated enlarged axillary lymph nodes. The other breast

was normal with no features of inflammation. The abscess was drained, and Augmentin was advised to the patient for five days with regular wound dressing. No microbiological investigation was done at this time. After three months, the patient again presented with a new swelling with similar features in the same breast. Breast ultrasound was done which detected two abscesses: one at 2-3 o'clock (2.9 cm x 2.8 cm x 2.1 cm) and another at 11-12 o' clock (2.9 cm x 1.9 cm x 1.5 cm). Multiple lymph nodes were observed in axilla. Incision and drainage were done to relieve symptoms. Blood and pus samples were sent for bacterial culture and sensitivity to microbiology department. Gram staining of the drained pus revealed a field full of neutrophils with gram-negative bacilli. Non-lactose fermenting organism was isolated, which was confirmed as *S. Paratyphi A* by serotyping (Denka Seiken Co., Tokyo, Japan) and Vitek-2 MS identification. For antibiotic susceptibility, the Kirby Bauer disk diffusion method was employed (HiMedia Laboratories, Mumbai, India). In accordance with the Clinical and Laboratory Standards Institute (CLSI) guidelines, the isolate was found susceptible to Ceftriaxone (30 μg), Chloramphenicol (30 μg), trimethoprim-sulfamethoxazole (1.25/23.75 μg), tetracycline (30 μg), and Ertapenem (10 μg) and resistant to nalidixic acid (30 μg), ampicillin (10 μg), ciprofloxacin (5 μg), and azithromycin (15 μg). The patient was advised for cefixime treatment and regular dressing. On follow-up, further detailed history was obtained. There was no history of past fever or gastroenteritis. Fresh stool and blood samples were obtained for culture and found negative for *S. Paratyphi A*. Serological test for typhoid was also found negative. The patient reported a decrease in symptoms. Four months later, the patient came back again with discharge from the nipple of the same breast. Repeat pus culture again isolated *S. Paratyphi A*. Antibiotic susceptibility report indicated a change in pattern showing susceptibility to Chloramphenicol, tetracycline, and Ertapenem and resistance to Ceftriaxone, nalidixic acid, ampicillin, ciprofloxacin, trimethoprim-sulfamethoxazole.

The patient started injectable antibiotics Ertapenem for seven days. The patient improved, and no complaints were there in follow-up visits.

3. Discussion

Salmonella spp. are gram-negative enteric bacilli that are rarely known to cause breast abscess [1]. The earliest case of breast abscess due to *S. Typhi* was described in 1907 by Thayer and Hazen in a young housemaid presenting to the John Hopkins Hospital, Baltimore [3].

Breast abscesses are common presentation in the surgery department with treatment based on drainage and antibiotics. Usually, the patients respond to commonly prescribed oral antibiotics. Failure to respond has been seen due to the emergence of resistance among microbes [4].

Atypical infections like this case can pose a challenge if microbiological confirmation is not sought. *S. Typhi* associated with breast abscesses are frequently reported in comparison with other serotypes of *Salmonella* [1].

Literature search has shown that *S. Paratphi A* has been only reported by six authors with a total of seven cases worldwide [1,5-9]. Microbiological confirmation with susceptibility data is important to prevent recurrence due to inadequate treatment.

Repeat presentation with multiple abscess in the same breast in this patient indicates therapeutic failure either due to survival of resistant strains and/or inadequate antibiotic penetration in abscess cavity. Even though incision and drainage take out most of the infective burden, the remaining source needs to be treated with the right antibiotic medication.

The risk factors for breast abscess caused by *Salmonella* species include extremes of age, immunosuppression, drug abuse, hemoglobinopathies, and previous trauma [10]. The patient in this study had no history suggestive of any of the above risk factors. Salmonellosis is endemic in India, and most case reports of *Salmonella* breast abscess were also from this country [7]. The incidence of breast abscess is 0.9% in patients with generalized typhoid infections [5]. A study from Mysore reported a chronic case of breast abscess by *S. Paratyphi A* for the first time in India [8]. Literature search suggested multiple associated risk factors like idiopathic thrombocytopenic purpura, Type II diabetes mellitus, and hypothyroidism [2,6,7].

Reports from other authors share similar presentations, i.e., unilateral involvement and female in the age group 25 to 45 years. Recurrence of symptoms was only reported in two cases, and one case had a chronic presentation of two years [8].

Our case had a longstanding presentation partially due to a lack of initial microbiological analysis. The selection of mutated resistant bacteria under antibiotic pressure may have led to the failure of therapy. The patient responded after switching to parenteral therapy. No symptoms were reported after six months of follow-up.

Most *S. Paratyphi A* breast abscess cases require injectable antibiotics as reported previously [2]. Such data, coupled with the remote possibility of *S. Paratyphi A* causing rare abscess, mandates microbiological confirmation and follow-up for complete resolution of symptoms.

Our patient had a complicated course of therapy with the emergence of the resistant strain. All previously reported cases had resolution with third-generation cephalosporins except the above-described case, which developed resistance over the course of therapy. Therefore, we report the first case of third-generation cephalosporins resistant *S. Paratyphi A* breast abscess requiring Ertapenem therapy for treatment. Injectable antibiotics should be sought in cases that show a lack or delayed response, and patients should be followed up with repeated microbial culture tests to confirm adequate response.

4. Conclusion

The rare etiology of this case should be a lesson to understand the importance of microbiological confirmation in the common clinical presentation of breast abscess. Such findings will help in expanding the current knowledge of causative agents and improve in management of patients

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Conflict of Interest Statement

The authors declare no conflict of interest.

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References

1. Hohmann, E.L. Non-typhoidal salmonellosis. *Clin Infect Dis* **2001**, *32*, 263-269.
2. Agrawal, S.; Yadav, V.S.; Srivastava, A.; Kapil, A.; Dhawan, B. Breast abscess due *to Salmonella paratyphi A*: Case reports with review of literature. *Intractable Rare Dis Res* **2018**, *7*, 130-133.
3. Thayer, W.S.; Hazen, H.H. Calcification of the breast following a typhoid abscess. *J Exp Med* **1907**, *9*, 1–17.
4. Russell, S.P.; Neary, C.; Abd Elwahab, S.; Powell, J.; O'Connell, N.; Power, L.; Tormey, S.; Merrigan, B.A.; Lowery, A.J. Breast infections - Microbiology and treatment in an era of antibiotic resistance. *Surgeon* **2020**, *18*, 1-7.
5. Ghadage, D.P.; Wankhade, A.B.; Mali, R.J.; Bhore, A.V. Recurrent breast abscess due to *Salmonella Paratyphi A*: An unusual case. *Int J Res Med Sci* **2014**, *2*, 1236-1238.
6. Deshpande, A.; Dash, L.; Pandya, J.S.; Zende, M. *Salmonella Paratyphi A* infection presenting as breast abscess. *BMJ Case Rep* **2019**, *12*, e228887.
7. Sood, S. Breast abscess by *Salmonella Paratyphi A:* Case report and literature review. *J Clin Diagn Res* **2015**, *9*, DD03-04.
8. Siddesh, G.; Sumana, M.N. A case of breast abscess due to *Salmonella Paratyphi A*. *Int J Health Allied Sci* **2012**, *1*, 109-111.
9. Fernando, S.; Molland, J.G.; Gottlieb, T. Failure of oral antibiotic therapy, including azithromycin, in the treatment of a recurrent breast abscess caused by *Salmonella enterica serotype Paratyphi A*. *Pathog Glob Health* **2012**, *106*, 366-369.
10. Brncic, N.; Gorup, L.; Strcic, M.; Abram, M.; Mustac, E. Breast abscess in a man due to *Salmonella enterica* serotype Enteritidis. *J Clin Microbiol* **2012**, *50*, 192-193.

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